Wisconsin
Department of Commerce

Evaluation # 200326-O

Safety & Buildings Division
201 West Washington Avenue
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Wisconsin
Building Products Evaluation

Material	Sturdy-Brace Intermediate Wall Sheathing
Manufacturer	Knight Celotex, LLC One Northfield Plaza, Suite 210 Northfield, Il 60093

SCOPE OF EVALUATION

GENERAL: This report evaluates Sturdy-Brace Intermediate structural wall sheathing. Sturdy-Brace Intermediate wall sheathing was also evaluated for vapor permeance and thermal conductivity. Sturdy-Brace Intermediate wall sheathing is manufactured by Knight Celotex, LLC.

This review includes the cited **Comm** code requirements below in accordance with the current **Wisconsin Uniform Dwelling Code (UDC), (for 1 & 2 family dwellings):**

- **Alternate Corner Bracing:** Sturdy-Brace Intermediate wall sheathing was evaluated as a wind bracing material in accordance with **s. Comm 21.25(1)(b)4.**
- **Vapor Permeance:** Sturdy-Brace Intermediate wall sheathing was evaluated as a vapor retarder in accordance with **s. Comm 22.22(1)(b).**
- **Thermal Performance:** Sturdy-Brace Intermediate wall sheathing was evaluated for use in building envelope calculations in accordance with **s. Comm 22.21**.

DESCRIPTION AND USE

Sturdy-Brace wall sheathing is produced from cellulosic (recovered wood chips) interlaced fiber bonded with asphaltic binders. Sturdy-Brace wall sheathing is an intermediate density, insulating, structural (corner bracing), and non-structural sheathing for use in residential construction, designed for use for framed walls under exterior finishes such as lap and panel sidings, stucco, masonry veneer and shake and shingle products. Sturdy-Brace wall sheathing is available ½" thick, 4' wide in lengths of 8', 9' and 10', with square edges.

TESTS AND RESULTS

Testing on the Sturdy-Brace wall sheathing was conducted by Stork/Twin City Testing Corporation, Report Number 18 01-31016. The following tests were conducted:

- ASTM C209, "Standard Methods of Testing Structural Insulating Board Made from Vegtable Fibers", Section 10, as required by ASTM C208;
- Modulus of Rupture, kPa (psi) was calculated from the transverse strength data;
- Deflection at Specified Minimum Load, mm (in.) was calculated from the transverse strength data;
- Tensile Strength Parallel to Surface was determined in accordance with ASTM C209, Section 11;
- Tensile Strength Perpendicular to Surface was determined in accordance with ASTM C209, Section 13;
- A 2-hour Water Absorption test was conducted in accordance with ASTM C209, Section 14;
- A 24-hour Water Absorption test (for ½" structural sheathing), refers to the 24 hour immersion test in ASTM D1037;
- Vapor Permeance test was conducted in accordance with ASTN E96, "Standard Test Methods for Water Vapor Transmission of Materials";
- Linear Expansion test was conducted in accordance with ASTN D1037; and
- Thermal Conductivity – thermal resistance testing was conducted in accordance with ASTM C518, "Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus".

Test Results

TEST	Machine Direction	Transverse Direction	ASTM C208 Requirements
Transverse Strength, N (kg) (lbf)	102(10.4)(22.9)	99.6 (10.2) (22.4)	89.0 N (9.07 kg) (20 lbf)(minimum)
Modulus of Rupture, kPa (psi)	4040 (586)	3910 (568)	2758 kPa (400 psi) (minimum)
Deflection at Spec. Load, mm (in.)	7.62 (o.300)	8.09 (0.319)	19 mm (0.75 in.) (maximum)
Tensile Strength Parallel to Surface, kPa (psi)	2420 (352)	2380 (345)	1379 kPa (200 psi) (minimum)
Tensile Strength Perpendicular to Surface, kPa (psi)	55.8 (1165)	---	38.3 kPa(800 psf) (minimum)
Water Absorption, 24 hr, %	9.59	---	15% (maximum) 24 hr test
Vapor Permeance, mg/s-m^2-kPa (grains/h•ft^2 in Hg)	1.597 (27.79)	---	0.287 mg / s-m^2 –kPa (minimum) (5 grains/hr• ft^2 in Hg (minimum)
Linear Expansion, 50-90% RH, %	0.10	0.11	6% (maximum)
Thermal Conductivity, W / m • K (Btu • in/h • ft^2 ° F)	0.061 (0.424)		0.063 (0.44) (maximum)

LIMITATIONS OF APPROVAL

The **Comm** limitations below are in accordance with the current **Wisconsin Uniform Dwelling Code (UDC), (for 1 & 2 family dwellings):**

- **Alternate Corner Bracing:** Sturdy-Brace wall sheathing was evaluated as a wind bracing material in accordance with **s. Comm 21.25(1)(b)4.** Sturdy-Brace wall sheathing is allowed to be installed as described below:

Recommended Nails or Staples: 1-1/2" No. 11 Gauge Galvanized Roofing Nails with 7/16" Head; 6d common nails, or 8d common nails. In stapling applications, where corner bracing is omitted, use 1-1/2" No. 14 Gauge Galvanized Wire Staples with 7/16" Crown and Divergent Chisel Points.

1. **Construction Practice:** Before anchoring sill plate, install Celotex Flexcell® Expansion Joint Filler or equivalent between sill and foundation wall. Erect framing 16" or 24" on center. Provide headers if and where ends of sheathing units will be unsupported, 4' x 9' units provide continuous coverage, including both sill and top plate.

Note: A vapor-retarder is required on the warm side of the exterior walls in accordance with **s. Comm 22.22** and must be continuous from lowest sill to top of the top plate unless headers or solid blocking is used**.**

2. Sheathing shall be applied **vertically** to the framing allowing 1/8" space between adjoining units. Sheathing is cut scant for this allowance.

3a. **Applied without diagonal corner bracing:** Celotex Sturdy-Brace Insulating Sheathing – fastened by nails or staples as specified above and with studs spaced 16" on center.

In application without diagonal corner bracing, nail or staple sheathing first to intermediate framing members at 6" centers, then fasten along all edges at 3" centers and not less than 3/8" from edge. Drive nails flush. Apply staples so that their crowns will slightly depress surface of sheathing, and with length of their crowns parallel to direction of edges of sheathing and long dimension of framing members. Panels are nail-marked for accurate fastening at intermediate 16" on center studs.

3b. **Applied with diagonal corner bracing:** nail spacing may be increased to 8" centers at intermediate framing members and 4" centers at edges. Staples may be spaced at 6" or 8" centers (depending upon their gauge) at intermediate framing members and at 4" centers at edges.

4. Bring sheathing units to moderate contact with framing around windows and doors– never force units into place.

5. Provide sheet metal flashing over head casing of all windows and doors

6. Apply lap and panel sidings in manner to insure that ends or edges fall over centerlines of studs.

7. All 1" air space between masonry veneer and sheathing.

Note: Vapor permeable sheathing paper is recommended only under stucco exterior finish. It is emphasized that such sheathing paper must be vapor-permeable paper such as red rosin paper or other product with a perm rating of not less than 5 perms. Under FHA Minimum Property Standards, vapor-permeable sheathing paper is required only under stucco finish. Polyethylene films, aluminum foil and similar materials are not acceptable as sheathing paper since they are not vapor-permeable.

8. For shake, shingle and vertical siding, nail siding to 1" x 2" horizontal wood furring strips spaced 16" on center and nailed over sheathing with at least 1" nail penetration into studs.

Note: Wider Nail Spacing for wood siding, stucco lath or metal ties for masonry veneer – fastened to framing by nails driven through sheathing and into studs – the spacing of nails may be increased to 12" on center at intermediate framing members and 6" on center at edges, except where local building regulations and FHA requirements specify additional fasteners.

This approval will be valid through December 31, 2008, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The product approval is applicable to projects approved under the current edition of the applicable codes. This approval may be void for project approvals made under future applicable editions. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Revision Date:
Approval Date: November 6, 2003 By: _____

Lee E. Finley, Jr.
Product & Material Review
Integrated Services Bureau

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